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REMARKS

The Disclosure has been amended as set out above to correct a typographical error noted by the Applicant. Specifically, U.S. Patent No. 6,244,361 was previously incorrectly referred to as "No. 6,224,361".

With respect to the Claims, Claims 1 - 38 are pending in the within Application. Of these Claims, the following amendments have been herein:

- (a) independent Claim 1 is amended to incorporate the subject matter of previous Claims 2, 3, 5, 6, 21, 29 and 30 and to further or better define the Applicant's invention as claimed.

In particular, Claim 1 has been amended to further define the plurality of interchangeable borehole engaging devices a being comprised of a plurality of interchangeable rotation restraining devices, wherein each of the plurality of interchangeable rotation restraining devices is comprised of a rotation restraining assembly for mounting in a pocket defined by an exterior of the apparatus housing, wherein the rotation restraining assembly is comprised of an assembly housing and a rotation restraining member connected with the assembly housing, wherein the assembly housing has an assembly housing size and wherein the assembly housing size defines the device size.

In addition to previous Claims 2, 3, 5, 6, 21, 29 and 30, support for this amendment is found in the Application at: Page 7, lines 9 - 22; Page 8, lines 23 - 24; Page 9, lines 1 - 13; Page 10, lines 1 - 14; Page 23, lines 4 - 14; Page 27, lines 31 - 32; Page 28, lines 5 - 14; Page 29, lines 5 - 14; Page 31, lines 6 - 14; Page 33, lines 4 - 18; and Figures 1 - 43.

- (b) dependent Claims 2, 3, 5, 6, 21, 29 and 30 have been cancelled as a result of the amendments to independent Claim 1;

- (c) dependent Claims 4, 7, 11, 13, 22 and 31 have been amended to change their respective claim dependencies as a result of the cancellation of the claims set out above;
- (d) independent Claim 34 is amended to incorporate the subject matter of portions of previous Claims 3 and 21 and previous Claims 5, 6, 29 and 30 and to further or better define the Applicant's invention as claimed.

In particular, Claim 34 has been amended to further define that each of the plurality of interchangeable rotation restraining devices is comprised of a rotation restraining assembly, wherein the rotation restraining assembly is comprised of an assembly housing and a rotation restraining member connected with the assembly housing, wherein the assembly housing has an assembly housing size, wherein the assembly housing size defines the device size and wherein the selecting step (b) is comprised of selecting the selected rotation restraining device having the assembly housing size to provide the drilling apparatus with the selected drilling apparatus size.

In addition to previous Claims 3, 5, 6, 21, 29 and 30, support for this amendment is found in the Application at: Page 7, lines 9 - 22; Page 8, lines 23 - 24; Page 9, lines 1 - 13; Page 10, lines 1 - 14; Page 23, lines 4 - 14; Page 27, lines 31 - 32; Page 28, lines 5 - 14; Page 29, lines 5 - 14; Page 31, lines 6 - 14; Page 33, lines 4 - 18; Page 33, line 30 - Page 34, line 22; Page 47, lines 19 - 28; Page 48, lines 7 - 14; and Figures 1 - 43.

- (e) dependent Claim 38 is amended to further or better define the Applicant's invention as claimed.

In particular, Claim 38 has been amended to claim wherein the selecting step (d) is comprised of selecting the second selected rotation restraining device having the assembly housing size to provide the drilling apparatus with the second selected drilling apparatus size.

Support for this amendment is found in the Application at: Page 33, lines 4 - 18; Page 33, line 30 - Page 34, line 22; Page 47, lines 19 - 28; Page 48, lines 7 - 14; Page 49, line 28 - Page 50, line 12; and Figures 1 - 43.

With respect to Claims 1 - 38, the Examiner has indicated that Claims 26 - 33 would be allowable if rewritten in independent form. However, the remaining claims have been rejected as follows:

- (a) Claims 1 - 2 and 34 - 38 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,419,395 to Harvey;
- (b) Claims 1 and 2 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 3,572,450 to Thompson; and
- (c) Claims 1 - 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,447,200 to Dedora et. al. in view of Harvey or Thompson.

It is respectfully submitted that these rejections of the Examiner are overcome by the amendments to independent apparatus Claim 1 and independent method Claim 34 and the remarks that follow.

Applicant's Claimed Invention -

The Applicant's independent apparatus Claim 1 and independent method Claim 34 have been amended to include portions of the subject matter of previous dependent Claims 2, 3, 5, 6, 29 and 30.

Thus, as a result of the amendments, the independent Claims are now directed at a variable gauge drilling apparatus and a method of assembly, wherein the drilling apparatus is comprised of a plurality of interchangeable rotation restraining devices, each of the plurality of interchangeable rotation restraining devices being comprised of a rotation restraining assembly, and wherein "the rotation restraining assembly is comprised of an assembly housing and a rotation

restraining member connected with the assembly housing, wherein the assembly housing has an assembly housing size and wherein the assembly housing size defines the device size."

Thus, as claimed, the plurality of interchangeable rotation restraining devices have different device sizes for mounting on the apparatus housing to provide the drilling apparatus with a drilling apparatus size. Further, the assembly housing of each rotation restraining assembly comprising the plurality of interchangeable rotation restraining devices has an assembly housing size, wherein the assembly housing size defines the device size. Accordingly, the size of the drilling apparatus is varied for insertion in a desired borehole size by varying the size of the assembly housing.

More particularly, "the apparatus housing 22 and the device mount 26 do not require any modification or adaptation." Thus, the same configuration and size of the apparatus housing and the device mount may be used with any of the plurality of interchangeable rotation restraining devices. As a result, the drilling apparatus size may be readily changed by removing one of the plurality of the rotation restraining devices having a first device size from the mount and mounting a further one of the plurality of the rotation restraining devices having a different second device size with the mount. (Page 24, lines 12 - 27 of the Application).

The device size provides the difference between the apparatus housing size and the drilling apparatus size. Given that the apparatus housing size and the mount defined by an exterior surface of the apparatus housing preferably do not vary, the device size is varied in order to achieve the selected drilling apparatus size. (Page 8, lines 1 - 19 of the Application).

More particularly, in the preferred embodiment, as claimed, the rotation restraining assemblies comprising the rotation restraining device are interchangeable in order to vary the size of the drilling apparatus. Specifically, the device size is varied by varying the size of the assembly housing of the rotation restraining assembly of each of the interchangeable rotation restraining devices. In other words, the assembly housing size of each of the rotation restraining assemblies is variable such that the plurality of interchangeable rotation restraining devices may be provided with differing devices sizes. (Page 10, lines 8 - 14; Page 33, lines 4 - 7 of the Application).

As defined at Page 33, lines 20 – 22 of the Application, the assembly housing size is defined “by the maximum depth of the assembly housing 60 measured between the top surface 70 and the bottom surface 72 of the assembly housing 60.”

Anticipation Rejection (Harvey)

Harvey is directed at an eccentric fluid displacement sleeve designed to adapt downhole logging tools for use in different sizes of borehole (Column 1, lines 7 - 12 of Harvey). The sleeve includes a plurality of integral blades, wherein the blade size is selected to match the borehole diameter. However, as the blades are integral with the sleeve, the entire sleeve is removed and replaced as necessary to accommodate for varying borehole sizes. (Column 3, lines 46 - 53 and 61 - 65 of Harvey).

More particularly, as shown in 4 and 5 of Harvey, a fluid displacement sleeve 40 is provided. The outer surface of the sleeve 40 includes three blades 42, 44 and 46. The three blades are integral with the remainder of the sleeve 40, being formed by machining out the area between the blades. (Column 5, lines 22 - 35 of Harvey). Further, Column 5, line 60 - Column 6, line 12 of Harvey states:

“Fluid displacement sleeve 40 may be easily replaceable when worn or damaged, or when it is desired to convert the instrument 10 for use in a different size borehole. As seen in Fig. 4, when it is desired to use instrument 10 in a larger than nominal diameter borehole, sleeve 40 can be unthreaded from drill collar 24 and replaced with sleeve 40’. ... Similarly, when it is desired to use instrument 10 in a smaller than nominal diameter borehole, sleeve 40 can be unthreaded from drill collar 24 and replaced with sleeve 40”.

Thus, it is clear that the entire sleeve 40, including all three blades 42, 44 and 46, is replaced.

Further, with replacement sleeve 40’, as shown in Fig. 4, the fluid displacement blade 42’ has the same thickness as the fluid displacement blade 42 on sleeve 40. However, the

positioning blades 44', 46' are thicker than positioning blades 44, 46 on sleeve 40. Similarly, with replacement sleeve 40'', as shown in Fig. 5, the fluid displacement blade 42'' has the same thickness as the fluid displacement blade 42 on sleeve 40. However, the positioning blades 44'', 46'' are thinner than positioning blades 44, 46 on sleeve 40. (Column 5, line 66 - Column 6, line 10 of Harvey).

In order to anticipate a claim, the reference must teach each and every element of the claim (U.S. Manual of Patent Examining Procedure "MPEP" §2131). It is respectfully submitted that Harvey does not teach each and every element of amended Claims 1 and 34, and therefore, amended Claims 1 and 34 are not anticipated by Harvey.

In this regard, it is noted that amended Claims 1 and 34 include portions of the subject matter of previous Claims 2, 3, 5, 6, 21, 29 and 30. None of Claims 3, 5, 6, 21, 29 or 30 were objected to by the Examiner as being anticipated by Harvey. Accordingly, it necessarily follows that amended Claims 1 and 34 include subject matter or elements that are not taught by Harvey, and that amended Claims 1 and 34 are therefore not anticipated.

In any event, Harvey describes an eccentric fluid displacement sleeve for use with a measurement-while-drilling instrument. Harvey does not describe or suggest in any manner that the sleeve would or could be used to restrain rotation of the instrument in the borehole. Therefore, Harvey does not teach, discuss or suggest an apparatus comprised of "a plurality of interchangeable rotation restraining devices" as claimed by the Applicant. Accordingly, it necessarily follows that Harvey does not teach, discuss or suggest any of the claimed structure of each of the plurality of interchangeable rotation restraining devices. Specifically, Harvey does not teach, discuss or suggest "a rotation restraining assembly" as claimed by the Applicant.

In fact, Harvey appears to anticipate that the sleeve 40 will rotate within, or relative to, the borehole during use of the instrument. For this reason, the outer edges of each blade 42, 44, 46 of the sleeve 40 are provided with a hardened surface 48 made from an appropriate material such as tungsten carbide. (Column 5, lines 35 - 40 of Harvey).

Further, Harvey describes an integral assembly housing and borehole engaging

members or blades. Harvey does not teach, discuss or suggest a rotation restraining assembly comprised of "an assembly housing and a rotation restraining member connected with the assembly housing" as claimed by the Applicant.

Finally, in order to vary the size of the sleeve 40 for insertion in varying borehole sizes, Harvey clearly contemplates varying the size of the blade or borehole engaging member, and specifically the size of the positioning blades 44, 46 of the sleeve 40. In particular, the positioning blades 44, 46 are made either thinner or thicker as required for the borehole size. Harvey does not describe, discuss or suggest in any manner the varying of the size of the body of the sleeve 40.

Thus, Harvey does not teach, discuss or suggest an assembly housing having an assembly housing size, "wherein the assembly housing size defines the device size" as claimed by the Applicant. Rather, if Harvey were to be applied to the Applicant's invention, Harvey would clearly contemplate or teach the varying of the size of the "rotation restraining member connected with the assembly housing" (i.e. the positioning blades). Thus, it is respectfully submitted that Harvey teaches away from the varying of the size of the assembly housing.

Anticipation Rejection (Thompson)

Thompson is directed at a directional drilling apparatus including at least one movable stabilizer blade for contacting the wall of the borehole in order to move the apparatus to influence the drilling direction. (Column 1, lines 60 - 73 of Thompson). More particularly, as shown in Figures 3 and 3a, the directional drilling apparatus or device 1 includes at least one movable stabilizer blade 10 and two interchangeable stabilizer blades 6 which are fixedly mounted within slots 7 defined by a collar 9 comprising the apparatus housing. (Column 3, lines 31 - 53 of Thompson).

In operation, the movable stabilizer blade 10 is moved laterally and into engagement with the borehole. Lateral movement of the movable stabilizer blade 10 causes movement of the drill string in the borehole such that the fixed stabilizer blades 6 contact the borehole and such that the drill bit is deflected in the desired direction. (Column 3, line 54 - Column 6, line 5 of Thompson).

The size of the fixed interchangeable stabilizer blades 6 is selected in order to ensure that the moveable stabilizer blade 10 may be contacted with the borehole in order to steer the drilling apparatus. Column 4, lines 55 - 60 of Thompson states:

"The difference in size between the undergauge stabilizer blades 6 and 7 and the movable stabilizer blade 10 determines the amount of deflection which would result from use of this deflector tool. The deflector tool can, of course, be manufactured with interchangeable blades for different amounts of deflection and also for use in boreholes of various sizes."

Thus, in order to adapt the apparatus for use in varying borehole sizes, Thompson clearly contemplates varying the size or radial extent of the interchangeable stabilizer blades and not the size of the housing or collar 9.

As stated above, in order to anticipate a claim, the reference must teach each and every element of the claim (MPEP §2131). It is respectfully submitted that Thompson does not teach each and every element of amended Claims 1 and 34, and therefore, amended Claims 1 and 34 are not anticipated by Thompson.

In this regard, it is again noted that amended Claims 1 and 34 include portions of the subject matter of previous Claims 2, 3, 5, 6, 21, 29 and 30. None of Claims 3, 5, 6, 21, 29 or 30 were objected to by the Examiner as being anticipated by Thompson. Accordingly, it necessarily follows that amended Claims 1 and 34 include subject matter or elements that are not taught by Thompson, and that amended Claims 1 and 34 are therefore not anticipated.

In any event, Thompson describes a directional drilling apparatus or deflector tool. Thompson does not describe or suggest in any manner that the deflector tool comprised of the various stabilizer blades would or could be used to restrain rotation of the drilling apparatus in the wellbore. Therefore, Thompson does not teach, discuss or suggest an apparatus comprised of "a plurality of interchangeable rotation restraining devices" as claimed by the Applicant. Accordingly, it necessarily follows that Thompson does not teach, discuss or suggest any of the claimed structure

of each of the plurality of interchangeable rotation restraining devices. Specifically, Thompson does not teach, discuss or suggest “a rotation restraining assembly” as claimed by the Applicant.

Further, in order to vary the size of the deflector tool for use in boreholes of various sizes, Thompson clearly contemplates the replacement of the “interchangeable blades.” Specifically, the size of each interchangeable stabilizer blade 6 fixedly mounted within a respective slot 7 of the collar 9 is varied. In particular, the radial extent of each stabilizer blade 6 is varied in order to be able to provide the desired deflection within the specific borehole size in combination with the movable stabilizer blade 10. Thompson does not describe, discuss or suggest in any manner the varying of the size of the collar 9 defining the slots 7 for the blades 6.

Thus, Thompson does not teach, discuss or suggest an assembly housing having an assembly housing size, “wherein the assembly housing size defines the device size” as claimed by the Applicant. Rather, if Thompson were to be applied to the Applicant’s invention, Thompson would clearly contemplate or teach the varying of the size of the “rotation restraining member connected with the assembly housing” (i.e. the interchangeable stabilizer blade). Thus, it is respectfully submitted that Thompson teaches away from the varying of the size of the assembly housing.

Obviousness Rejection (Dedora et. al., Harvey and Thompson)

Dedora relates to an apparatus for cleaning sand from a production liner of a borehole, not a drilling apparatus. Specifically, the sand clean-out device 2 is connected to a lower end of a tubing string 4 operating within a casing 6, and is provided for clearing sand 10 from the horizontal production liner 12 of the borehole. (Column 3, lines 9 - 17 of Dedora). The sand clean-out device 2 includes an anti-rotation device 20. The anti-rotation device 20 includes a series of sets 45 of wheels 46 spaced about the periphery of the anti-rotation device 20. (Column 3, lines 43 - 57 of Dedora).

However, as stated by the Examiner: “Dedora does not disclose the engaging devices having different diameters that are interchangeable.”

Specifically, there is no discussion or suggestion in Dedora whatsoever that the anti-rotation device 20 would be interchangeable or replaceable for any reason whatsoever. Further, there is particularly no discussion or suggestion regarding the varying of the size of the anti-rotation device 20 to accommodate different borehole sizes. As a result, it necessarily follows that there is no discussion or suggestion that any particular part, portion or component of the anti-rotation device 20 may be varied to provide the desired device size.

The Examiner has taken the position that it would have been obvious to modify the apparatus of Dedora to have "interchangeable engaging devices having different sizes" in view of the teachings of Harvey and Thompson.

However, in order to establish a *prima facie* case of obviousness, the prior art references must teach or suggest all the claim limitations. Further, there must be some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to combine the references. (MPEP §2143, §2143.01, §2143.03)

First, it is submitted that the references do not teach or suggest all of the claim limitations.

In order to vary the size of the sleeve 40 for insertion in varying borehole sizes, Harvey clearly contemplates **varying the size of the blade or borehole engaging member**, and specifically the size of the positioning blades 44, 46 of the sleeve 40. Harvey does not describe, discuss or suggest in any manner the varying of the size of the body of the sleeve 40.

In order to vary the size of the deflector tool for use in boreholes of various sizes, Thompson also clearly contemplates **varying the size of the "interchangeable blades" or borehole engaging members**, and specifically, the size or radial extent of each interchangeable stabilizer blade 6 fixedly mounted within a respective slot 7. Thompson does not describe, discuss or suggest in any manner the varying of the size of the collar 9 defining the slots 7 for the blades 6.

Dedora does not discuss or suggest the varying of **any** of the components of the anti-rotation device to accommodate different borehole sizes. As a result, it necessarily follows that

Dedora does not describe, discuss or suggest in any manner the varying of the "assembly housing" size.

Thus, none of Harvey, Thompson and Dedora teach, discuss or suggest an assembly housing having an assembly housing size, "wherein the assembly housing size defines the device size" as claimed by the Applicant. In fact, it is submitted that both Harvey and Thompson specifically teach away from this limitation by expressly varying the device size by varying the size of the borehole engaging members. Thus, the size of the borehole engaging members defines the device size, and not the assembly housing size.

Second, it is submitted that there is no suggestion or motivation to modify Dedora or to combine the references as suggested by the Examiner.

In this regard, it is submitted that Harvey and Thompson are non-analogous art which would not be applicable to Dedora given the clear structural and functional differences between Dedora as compared with each of Harvey and Thompson.

Dedora relates to an apparatus for cleaning sand from a production liner of a borehole, which apparatus is comprised of an anti-rotation device. In considering the modification of the anti-rotation device, one skilled in the art would necessarily look to other anti-rotation devices. However, neither Harvey nor Thompson relate in any manner to, or describe, anti-rotation devices.

Rather, Harvey describes an eccentric fluid displacement sleeve for use with a measurement-while-drilling instrument, wherein the sleeve includes integral positioning blades. Harvey does not describe or suggest in any manner that the sleeve would or could be used to restrain rotation of the instrument in the borehole. In fact, Harvey clearly anticipates that the sleeve will rotate within, or relative to, the borehole during use of the instrument. Further, varying of the size of the sleeve requires the complete replacement of the sleeve, not a component thereof. Given these significant structural and functional differences, Harvey would be considered to be non-analogous art and would not be applicable to the anti-rotation device of Dedora.

Thompson describes a directional drilling apparatus or deflector tool. Thompson does not describe or suggest in any manner that the deflector tool comprised of the fixed interchangeable stabilizer blades would or could be used to restrain rotation of the drilling apparatus in the borehole. Rather, the stabilizer blades are clearly utilized to permit the deflection of the drilling bit in the borehole in a desired direction upon lateral movement of the movable blade. Given these significant structural and functional differences, Thompson would also be considered to be non-analogous art and would not be applicable to the anti-rotation device of Dedora.

In any event, there is no motivation or suggestion provided by Dedora to modify the anti-rotation device in the manner suggested by the Examiner or to otherwise combine the references to provide for the Applicant's claimed invention.

As indicated above, there is no discussion or suggestion in Dedora whatsoever that it would be desirable or preferable for the anti-rotation device 20 or any of its components to be interchangeable or replaceable for any reason whatsoever. In this regard, there is no discussion or suggestion in Dedora whatsoever relating to the size of the anti-rotation device as compared with the borehole size such that the variation of the device size would be seen as desirable.

Further, if the size of the anti-rotation device of Dedora were to be varied, there is no discussion or suggestion in Dedora that any particular part, portion or component of the anti-rotation device would be preferably or desirably varied to provide the desired device size. In this case, if Dedora were to be combined with Harvey or Thompson, the express teachings of Harvey and Thompson would clearly lead one skilled in the art to either replace the entire anti-rotation device or to vary the size of the borehole engaging members.

The Applicant claims a rotation restraining assembly comprised of "an assembly housing and a rotation restraining member connected with the assembly housing" wherein "the assembly housing size defines the device size."

As stated, Harvey describes an integral "assembly housing" and "borehole engaging members" or blades. Thus, to change the size of the device for a particular borehole size, the entire or complete sleeve (i.e. the entire rotation restraining assembly) must be replaced, not a mere

component of it. Further, if only one component of the "rotation restraining assembly" of Dedora were to be modified, Harvey expressly contemplates and teaches the varying of the size of the "rotation restraining member connected with the assembly housing" (i.e. the positioning blades) and not the "assembly housing." In other words, Harvey expressly **contemplates and teaches the "rotation restraining member connected with the assembly housing" as defining the device size.** Thus, as indicated above, Harvey expressly teaches away from "the assembly housing size" defining the device size, as claimed by the Applicant.

Similarly, Thompson describes a deflector tool comprised of fixed interchangeable stabilizer blades mounted in corresponding slots of a stabilizer collar. Thus, to modify the size of the deflector tool for a particular borehole size, the size of the interchangeable stabilizer blade is varied. Thus, if the "rotation restraining assembly" of Dedora were to be modified, Thompson expressly contemplates and teaches the varying of the size of the "rotation restraining member connected with the assembly housing" (i.e. the fixed stabilizer blades) and not the "assembly housing." In other words, Thompson also expressly **contemplates and teaches the "rotation restraining member connected with the assembly housing" as defining the device size.** Thus, as with Harvey, Thompson also expressly teaches away from "the assembly housing size" defining the device size, as claimed by the Applicant.

Summary -

In summary, it is respectfully submitted that none of Harvey, Thompson and Dedora, either alone or in combination, describe, teach or suggest in any manner whatsoever a variable gauge drilling apparatus comprising a plurality of interchangeable rotation restraining devices, wherein each of the plurality of interchangeable rotation restraining devices is comprised of a rotation restraining assembly for mounting in a pocket, wherein the rotation restraining assembly is comprised of an assembly housing and a rotation restraining member connected with the assembly housing, wherein the assembly housing has an assembly housing size and wherein the assembly housing size defines the device size, as claimed in amended Claim 1.

Further, it is respectfully submitted that none of Harvey, Thompson and Dedora, either alone or in combination, describe, teach or suggest in any manner whatsoever a method for

assembling a variable gauge drilling apparatus comprising the step of selecting a selected rotation restraining device from a plurality of interchangeable rotation restraining devices, wherein each of the plurality of interchangeable rotation restraining devices is comprised of a rotation restraining assembly, wherein the rotation restraining assembly is comprised of an assembly housing and a rotation restraining member connected with the assembly housing, wherein the assembly housing has an assembly housing size, wherein the assembly housing size defines the device size and wherein the selecting step (b) is comprised of selecting the selected rotation restraining device having the assembly housing size to provide the drilling apparatus with the selected drilling apparatus size, as claimed in amended Claim 34.

It is therefore respectfully submitted that amended independent Claims 1 and 34 are allowable and allowance of these Claims is respectfully requested. Further, dependent Claims 4, 7 - 20, 22 - 28 and 31 - 33 all depend directly or indirectly from independent Claim 1, while dependent Claims 35 - 38 all depend directly or indirectly from independent Claim 34. Thus, it is respectfully submitted that these dependent Claims are allowable for the distinctions defined therein as well as for the reasons supporting the allowability of amended Claims 1 and 34 and allowance of these dependent Claims is also respectfully requested.

In view of the foregoing amendments and remarks, it is submitted that this Application is in condition for allowance and allowance is respectfully requested.

Respectfully submitted,
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